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Early and Five-year Amputation and Survival Rate of Diabetic Patients with Critical Limb Ischemia: Data of a Cohort Study of 564 Patients

Faglia E., Clerici G., Clerissi J., Gabrielli L., Losa S., Mantero M., Caminiti M., Curci V., Lupattelli T., Morabito A.. Eur J Vasc Endovasc Surg 2006;32:484-90.

Objective To evaluate the early and late major amputation and survival rates and related risk factors in diabetic patients with critical limb ischemia (CLI).

Design Retrospective study.

Methods Revascularization feasibility, major amputation, survival rate and related risk factors were recorded in 564 diabetic patients consecutively hospitalized for CLI from 1999 to 2003 and followed until June 2005.

Results Peripheral angioplasty (PTA) was carried out in 420 (74.5%), bypass graft (BPG) in 117 (20.7%) patients. In 27 (4.8%) patients both PTA and BPG were not possible. Twenty-three above-the-ankle amputations (4.1%) were performed at 30 days: 6 in PTA patients, 3 in BPG patients, 14 in non revascularized patients. In the follow-up of 558 patients (98.9%), 62 repeated PTAs and 9 new BPGs, 32 new major amputations (16 in PTA patients, 14 in BPG patients and 2 in non-revascularized patients) were performed. Major amputation was associated with absence of revascularization (OR 35.9, $p<0.001$, CI 12.9–99.7), occlusion of each of the three crural arteries (OR 8.20, $p=0.022$, CI 1.35–49.6), wound infection (OR 2.1, $p=0.004$ CI 1.3–3.6), dialysis (OR 4.7, $p=0.001$ CI 1.9–11.7) increase in $TcPO_2$ after revascularization (OR 0.80, $p<0.001$ CI 0.74–0.87).

One hundred seventy three patients died during follow-up and this was associated with age (HR 1.05, $p<0.001$ CI 1.03–1.07), history of cardiac disease (HR 2.16, $p<0.001$ CI 1.53–3.06), dialysis (HR 3.52, $p<0.001$ CI 2.08–5.97), absence of revascularization (HR 1.68, $p<0.001$, CI 1.29–2.19) and impaired ejection fraction (HR 1.08, $p<0.001$, CI 1.05–1.09).

Conclusions In diabetic patients with CLI the revascularization is feasible in most cases and allows a low rate of early major amputation. This rate is higher in the follow-up period. Major amputation is very high in patients where revascularization is not feasible while the high mortality rate is due to the serious comorbidities observed in these patients.

Prognostic Significance of Raised Cardiac Troponin T in Patients Presenting with Acute Limb Ischaemia

Rittoo D., Stahnke M., Lindesay C., Grocott E., Hickey N., Downing R.. Eur J Vasc Endovasc Surg 2006;32:500-03.

Objective To study the relation between serum cardiac troponin T (cTnT) and mortality in patients presenting with acute limb ischaemia secondary to an embolism.

Material and methods A two years prospective study of all patients admitted to the vascular unit with a diagnosis of acute limb ischaemia secondary to an embolism. On admission all patients had an ECG. A blood sample was taken for measurement of cTnT, CRP, serum biochemistry, full blood count and clotting. All embolectomies were performed under local anaesthesia. Patients were followed until discharge from hospital and up to twelve months after surgery.

Results There were 37 patients with lower limb and 2 patients with upper limb ischaemia. Twenty four patients were female and fifteen were male, with the mean age of 76 years (50–95) for women and 84 years (77–90) for men. Seventeen patients (44%) had a raised cTnT. The patients with raised cTnT were older than those with normal cTnT [86y (77–92) vs 77y (51–95), p=0.01, t test]. The mean cTnT was 0.20 μg/L (range: 0.11–0.27). Only two patients with raised cTnT gave a history of chest pains. All of the patients with an elevated cTnT had also raised CRP. There was no significant difference in the serum creatinine in the group of patients with elevated cTnT compared to those with normal cTnT [112 μmol/L (range 98–159) vs 119 μmol/L (range: 47–177), p=ns]. The cumulative survival for cTnT+ patients at 7 days was 53% and that of cTnT− patients was 100%. The cumulative survival for cTnT+ and cTnT− patients was statistically different (p=0.0000, $\chi^2=13.1$, Log Rank test). Using regression analysis, an elevated cTnT was found to be an independent predictor of outcome.

Conclusion A significant proportion of patients presenting with an acutely ischaemic limb have an elevated cTnT. An elevated cTnT may be an early marker of overall disease severity and a predictor of outcome.

A Randomised Trial of Endovascular and Open Surgery for Ruptured Abdominal Aortic Aneurysm – Results of a Pilot Study and Lessons Learned for Future Studies

Hinchliffe R.J., Bruijstens L., MacSweeney S.T.R., Braithwaite B.D.. Eur J Vasc Endovasc Surg 2006;32:506-13.

Introduction EVAR has the potential to improve outcome after ruptured abdominal aortic aneurysm (AAA). Published series have been based upon selected populations.

Methods An interim analysis of a single centre prospective randomised controlled trial comparing endovascular aneurysm repair (EVAR) with open aneurysm repair (OAR) in patients with ruptured AAA was performed. Patients who had a ruptured AAA and who were considered fit for open repair were randomised to EVAR or OAR after consent had been obtained. Those in the EVAR group had pre-operative spiral computed tomographic angiography (CTA). The primary endpoint was operative (30-day) mortality and secondary endpoints were moderate or severe operative complications, hospital stay and time between diagnosis and operation. A power study calculation required 100 patients to be recruited.

Results Between September 2002 and December 2004, 103 patients were admitted with suspected ruptured AAA. Only 32 patients were recruited to the study. Of these, four patients died before receiving surgical treatment. On an intention to treat basis the 30-day mortality rate was 53% in the EVAR group and 53% in the OAR group. Moderate or severe operative complications occurred in 77% in the EVAR group and in 80% in the OAR group. Median total hospital stay in the EVAR group was 10 days (inter-quartile range 6–28) and 12 days (4–52) in the OAR group. Median time between diagnosis and operation was 75 minutes (64–126) in the EVAR group and 100 minutes (48–138) in the OAR group.

Conclusions Despite the relative high operative mortality in the EVAR group, these preliminary results show that it is possible to recruit patients to a randomised trial of OAR and EVAR in patients with ruptured AAA. CT scanning does not delay treatment.

The Mid-term Effect of Bare Metal Suprarenal Fixation on Renal Function Following Endovascular Abdominal Aortic Aneurysm Repair

Davey P., Rose J.D., Parkinson T., Wyatt M.G.. Eur J Vasc Endovasc Surg 2006;32:516-22.

Objective The aim of this study was to assess the mid term effect of proximal bare metal fixation design on renal function in patients undergoing endovascular repair (EVR) of abdominal aortic aneurysm (AAA).

Methods Consecutive EVR patients for AAA from December 1995-2001 were included and grouped to either infrarenal (Group 1) or uncovered suprarenal (Group 2) fixation. Peri-operative renal function and at 6, 12 and 24 months was determined by serum creatinine (sCr $mmoll^{-1}$) and Cockroft-Gault creatinine clearance (CrC $mlmin^{-1}$). Changes in renal function were compared using non-parametric analysis.

Results Of the 179 EVR procedures during this six-year period, paired renal data was available for 135 patients at a minimal follow-up of 6 months (Gp1, n=63; Gp2, n=72). Median pre-EVR sCr and CrC were 113, 57 in Group 1 and 108, 58 in Group 2, p=NS. There was no significant deterioration in renal function within or between either group at 2 years post-EVR: median sCr, CrC values were 118, 56 (Group 1) and 111, 56 (Group 2), all p=NS.

Conclusion This study suggests mid-term renal function remains unaffected following EVR of AAA, irrespective of proximal fixation type. Designs to improve stent durability and EVR applicability do not appear to compromise renal function.

Duplex Ultrasound Scanning is Reliable in the Detection of Endoleak Following Endovascular Aneurysm Repair

Sandford R.M., Bown M.J., Fishwick G., Murphy F., Naylor M., Sensier Y., Sharpe R., Walker J., Hartshorn T., London N.J., Sayers R.D.. Eur J Vasc Endovasc Surg 2006;32:537-41.

Objective To investigate the value of duplex ultrasound scanning (DUSS) in the routine follow up of patients following EVAR.

Methods Imaging was reviewed for 310 consecutive patients undergoing EVAR at a single centre. Concurrent ultrasound and CT scans were defined as having occurred within 6 months of each other. There were 244 paired concurrent DUSS and CT scans which were used for further analysis.

These modalities were compared with respect to sensitivity, specificity, positive and negative predictive values and level of agreement (by Kappa statistics) using CT as the 'gold standard'.

Results DUSS failed to detect a number of endoleaks which were seen on CT and the sensitivity of this test was therefore poor (67%). However, the specificity of DUSS compared more favourably with a value of 91%. Positive predictive values ranged from 33–100% but negative predictive values were more reliable with values of 91–100% at all time points post operatively. There were no type I leaks, or endoleaks requiring intervention which were missed on DUSS. Overall, there was a 'fair' level of agreement between the two imaging modalities using Kappa statistics.

Conclusion Although DUSS is not as sensitive as CT scanning in the detection of endoleak, no leaks requiring intervention were missed on DUSS in this study. DUSS is much cheaper than CT and avoids high doses of radiation. DUSS therefore remains a valuable method of follow up after EVAR and can reduce the need for repeated CT scans.

Fresh Arterial Grafts as Conduits for Vascular Reconstructions in Transplanted Patients

Matia I., Adamec M., Janousek L., Lipar K., Viklicky O.. Eur J Vasc Endovasc Surg 2006;32:549-56.

Objectives To assess the outcome of arterial allografts in patients receiving organ transplantation.

Design From October 1997 to June 2005, we used fresh arterial allografts as vascular conduits in 21 patients for the treatment of claudications (10), abdominal aortic aneurysm (6), complicated renal transplantation (2), acute lower extremity ischemia (2) and gangrene (1). At the time of the vascular procedure, ten of the patients (Group A) had already undergone organ transplantation. The mean follow up period was 32 months for renal and 37 months for heart recipients, respectively. In 11 patients (Group B), the vascular reconstruction was undertaken simultaneously with the renal transplantation. The mean follow up period was 49 months.

Results There was no arterial allograft related deaths. No signs of arterial graft infection or requirement for secondary intervention (angioplasty and/or thrombolysis) were observed during the follow up period.

Conclusions Our experience suggests that it is possible to use fresh arterial allografts in the treatment of arterial occlusive disease or abdominal aortic aneurysm, both in already transplanted patients and simultaneously with organ transplantation, with good results.

High Risk Plaque, High Risk Patient or High Risk Procedure?

Naylor A.R., Golledge J.. Eur J Vasc Endovasc Surg 2006;32:557-60.

SAPPHIRE, a randomised trial of endarterectomy versus angioplasty in 'high-risk' patients, concluded that angioplasty was 'not inferior' to surgery. This has subsequently been translated to mean that angioplasty was 'preferable' or 'advisable' in patients considered high-risk for surgery, with no further discrimination between symptomatic and asymptomatic individuals. Moreover, there have been suggestions that the accepted procedural risks may have to be increased in these patients. In fact, 71% of patients in SAPPHIRE were asymptomatic in whom there was an average 6% 30-day death/stroke rate. At this level of risk, neither surgery nor angioplasty could ever prevent long-term stroke. The concept of identifying high-risk patients is laudable, but they should be high risk for stroke (i.e. symptomatic). There is currently little systematic evidence to include asymptomatic patients within this definition.

Chronic Venous Disease Treated by Ultrasound Guided Foam Sclerotherapy

Smith P. Coleridge. Eur J Vasc Endovasc Surg 2006;32:577-83.

Aim To report the outcome of a series of patients with chronic venous disease due to incompetence of saphenous trunks managed by ultrasound guided foam sclerotherapy (UFS).

Patients and methods A group of 808 patients comprise this series. CEAP clinical class for limbs was C1: 15%, C2: 81%, C3: 0.5%, C4: 2%, C5: 0.2%, C6: 0.4%. UFS using 1% polidocanol (107 limbs), 1% sodium tetradecyl (102 limbs), 3% sodium tetradecyl (900 limbs) was employed to treat incompetent saphenous trunks. In patients with unilateral varices 1 treatment was required in 43% of patients and 2 treatments in 48% of patients to obliterate incompetent saphenous trunks and varices. For bilateral varices 2 treatments were required in 40% of patients and 3 treatments in 46% of cases.

The clinical outcome and patency of treated veins on duplex ultrasonography was assessed at a mean follow-up interval of 11 months.

Results A total of 459 limbs were available for assessment at a follow-up interval of 6 months or greater. The CEAP clinical stage was C0:182 limbs, C1: 241, C2: 22, C3: 0, C4: 11, C5: 2, C6:1. The GSV had remained obliterated in 88% of limbs and the SSV in 82% of limbs. Recurrent venous incompetence following previous surgery was as effectively treated by UFS as primary incompetence.

Conclusions This technique is useful in the management of chronic venous disease as an alternative to surgery.